

Retired Professional Basketball Player Cardiac Screening Program

Echocardiography Protocol 2015-2016

PROCEDURES AND PROTOCOL

I. Getting Started:

- A. Review key elements of exam to be performed
- B. Optimize instrument settings prior to starting study
- C. Verify indication for exam

II. Procedure Preparation:

- A. Review the order for type of study to be performed
- B. Enter patient information into ultrasound system
- C. Enter demographics, heights, weight, BP, sonographers' name, all other information as needed

III. Patient Preparation:

- A. Explain procedure to patients
- B. Verify patient ID
- C. Instruct patient to lie on left side
- D. Apply electrodes and attach leads

IV. Digital Capture

- A. Make sure that you have adequate ECG signal
- B. Patients in sinus rhythm 2 beat captures are used
- C. Patient in Atrial Fibrillation or any irregular rhythm, 3-5 beat captures should be used as needed

If images are suboptimal (greater than or equal to two adjacent segments in an apical view) and primary question is LV function and wall motion, consider use of a transpulmonic agent (echo contrast) after discussion with Cardiology Fellow or Attending.

Basic Exam (note: in general obtain a 2 D image of the view first, followed by color / spectral Doppler in order to provide anatomic orientation). In general, spectral Doppler and M-mode should be captured at a sweep speed of 50 mm/s speed. Use 25-50 mm/s speed to demonstrate respirophasic changes that require documentation of changes across several cardiac cycles and 100 mm/s speed when making timing measurements.

Optimization of Doppler signals. Doppler display occupies about 2/3 of scale for each velocity.

Pay particular attention to:

- Narrow aiming sector to optimize color and frame rate
- If 2D imaging is poor (esp. in apical views) or two or more LV segments are unable to be assessed, contrast may be considered to enhance the image.
- Proper setting of the scale, gain, filter, compress and reject with CW & PW Doppler
- Look at extracardiac structures
- Use off-axis images when necessary

IMAGING PROTOCOL

Parastrenal Long Axis

2-D with increased depth to R/O effusion

M-mode AoV, MV, LV (3 separate images)

Measure LV at level of Chordae

Measure LVOT, Ao Sinus, STJ

Measure LA at end systole

2-D normal depth

2-D color MV, AoV

2-D RV inflow of TV

2-D RV inflow color flow

CW Doppler TR & measure velocity (enter in analysis RVSP)

2-D RV outflow of PV

2-D color of PV

Measure PV peak velocity and PVR end diastolic velocity if present

Measure RVAWd if seen well enough

Parasternal Short Axis

LV apical (below papalary muscle)

LV mid (level of papalary tips)

LV basal (chordate level)

MV

AoV, PV, Tv

AoV with color flow

AoV showing coronary origins (use zoom if needed)

PW Doppler of TVR and measure RVSP

CW Doppler of PV and measure peak velocity and PVI end diastolic velocity if present

Apical 4-Chamber

2-D non-forshortened view

2-D color MV

PW Doppler of MV measure E, A, Decel Time.

Tissue Doppler of Lateral annulus, measure E', A'

Tissue Doppler of Medial annulus, measure E', A'

Measure LA volume (trace area and measure length)

Measure LV volume in systole and diastole for EF calculation (area length)

Color Doppler LVOT, AoV

PW Doppler LVOT velocity
CW Doppler AoV
Color Doppler of TV
CW Doppler of TVR and measure velocity if present and enter into RVSP in Analysis
Color Doppler of IAS R/O ASD/PFO
Color Doppler of IVS R/O VSD
Measure TAPSE

Apical 2-Chamber

2-D of LV and LA, be careful not to foreshorten view. Try to optimize image for best assessment of LV wall motion.

2-D color of MV

Measure LA volume (make sure LA volume index calc is complete)

Apical 3-Chamber

2-D image of LV, LA, LVOT, AoV

2-D color

Subcostal View

2-D of 4-chambers (normal respiration)

2-D of 4 chambers (deep inspiration in needed for best image)

2-D color of MV, TV, IAS to R/O shunt

2-D longitudinal view of IVC, watch for collapse with "Sniff"

2-D color of Hepatic veins/IVC Flow

2-D short axis of LV if possible (deep Inspiration)

Measure RVAWd

Suprasternal Notch

2-D of ascending Ao

2-D color of Ascending Ao

2-D color of arch with great vessels

2-D of descending Ao

2-D color of descending Ao

PW and CW as needed

Right Parasternal

2-D as needed if Ao disease suspected (Dissection, ect)

CW Doppler as needed for Ao stenosis

Additional off axis views should be performed as needed to confirm or R/O pathology in difficult cases.